

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Appln. No. 10/087,928
Attorney Docket No.: Q68813

REMARKS

Claims 1-15 are all the claims pending in the application. By this Amendment, Applicant editorially amends claims 1-13. The amendments to claims 1-13 were made for reasons of precision of language and consistency, and do not narrow the literal scope of the claims and thus do not implicate an estoppel in the application of the doctrine of equivalents. The amendments to claims 1-13 were not made for reasons of patentability. In addition, claims 1, 5, 6, 10, 11, and 13 are amended to further clarify the invention. By this Amendment, Applicant adds claims 14 and 15. Claims 14 and 15 are clearly supported throughout the specification.

Preliminary Matters

The Examiner has acknowledged the claim to foreign priority and confirmed that the certified copy of the priority documents was received. The Examiner has initialed the references listed on form PTO/SB/08 A & B submitted with an Information Disclosure Statement filed on March 5, 2002. The Examiner has also indicated that the Drawings filed on March 5, 2002 are accepted.

Statement of Substance of Interview

A copy of an Examiner's Interview Summary Record (PTO-413) was faxed to Applicant's representative. The PTO-413 requires applicant to file a Statement of Substance of the Interview. The Statement of Substance of the Interview is as follows:

The interview was administrative in nature. That is, Applicant called the Examiner on March 21, 2005 because the Office Action Summary of the Non-Final Office Action dated February 16, 2005 indicated that claims 1-6 and 8-13 stand rejected and that claims 2 and 7 are

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objected and because the Detailed Action of the Non-Final Office Action indicated that claims 1, 2-6, and 8-13 stand rejected under 35 U.S.C. § 103(a) and that claims 2 and 7 contain allowable subject matter. The Examiner agreed that the Office Action should indicate claims 1, 3-6 and 8-13 stand rejected and that claims 2 and 7 contain allowable subject matter. Notice mailed January 19, 2005 regarding the Power of Attorney was issued in error and that Power of Attorney filed July 29, 2004 is accepted.

It is respectfully submitted that the instant STATEMENT OF SUBSTANCE OF INTERVIEW complies with the requirements of 37 C.F.R. §§1.2 and 1.133 and MPEP §713.04.

Summary of the Office Action

Turning to the merits of this Office Action, the Examiner indicated that claims 1, 3-6, and 8-13 are rejected under 35 U.S.C. § 103(a) and that claims 2 and 7 contain allowable subject matter.

Prior Art Rejections

With regard to the prior art rejection, claims 1, 2, 4-6, and 8-13 stand rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 5,351,305 to Wood et al. (hereinafter "Wood") in view of U.S. Patent No. 5,729,290 to Tolumitsu et al. (hereinafter "Tolumitsu"). Applicant respectfully traverses these rejections in view of the following comments.

The Examiner contends that Wood in view of Tolumitsu suggests each feature of independent claims 1, 5, 6, 10, 11, and 13. This rejection is not supportable for at least the following reasons. First, independent claim 1, among a number of unique features, recites:

calculating edge information comprising a grade
and a direction of a slope of the extracted edge;

selecting preset filter information based on the
calculated edge information; and

smoothing all of the digital data based on the
selected filter information

The Examiner contends that Wood teaching of smoothing edges more parallel to its direction is equivalent to smoothing the digital data based on the filter information selected at the filter information selection step (see page 2 of the Office Action).

Wood, however, is not significantly different from the prior art disclosed in Applicant's specification. That is, Wood teaches conditional branching by using pixel selecting means 40, which passes a pixel directly to the image assembling means D, if the pixel is not near an edge, whereas pixels near the edge are further filtered (Fig. 1B; col. 4, lines 43 to 54). In other words, in Wood, the filter is not applied to all of the digital data but only to the pixels near the edges. Wood only teaches smoothing the pixels near the edges using various filters and not smoothing the digital data as a whole using various filters. In short, Wood is a conventional technique, which uses conditional branching.

Next, Tolumitsu does not cure the deficient teachings of Wood. In general, Tolumitsu teaches a movement detection device for detecting movement of an image incident on an image sensing device and for compensating for that movement (*see* Abstract). Specifically, with respect to the processing, Tolumitsu only teaches conventional A/D, D/A converters and as such clearly does not cure the deficient teachings of Tolumitsu.

Therefore, "smoothing all of the digital data based on the selected filter information," as set forth in claim 1, is not suggested or taught by the combined teachings of Wood and Tolumitsu, which lack smoothing all of the digital data of the input image as opposed to the

edges based on the selected filter information, where the filter information is selected based on a grade and a direction of the slope of the extracted edge. In short, together, the combined teachings of these references would not have (and could not have) led the artisan of ordinary skill to have achieved the subject matter of claim 1. Moreover, since claims 3 and 4 depend on claim 1, they are patentable at least by virtue of their dependency. It is appropriate and necessary for the Examiner to withdraw this rejection of claims 1, 3, and 4.

In addition, dependent claim 4 recites:

calculating luminance using the digital data; and
calculating a smoothing strength using the
luminance,
wherein the filter information that corresponds
to the calculated edge information and the
calculated smoothing strength is selected.

The Examiner contends that Wood's teachings of applying soft or hard filters is equivalent to calculating luminance using the digital data and calculating a smoothing strength using the luminance (see page 3 of the Office Action). Applicant respectfully disagrees.

Wood teaches that the hard and soft directional filters both filter parallel to the same directions. The hard filter functions differ from the soft filter functions in that the filter function is larger in order to force the data more strongly towards black or white than the soft filter function, which allows a smoother transition. Although it is preferred that the hard and soft filter functions operate along the same directions, it is contemplated that the filter functions might operate along different directions. As stated above, if there is a priori information about the nature of the data which would show that the crisp or hard and dull or soft edges tend to lie

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primarily along identifiable axes, possibly along different selectable axes, the filter functions may be oriented accordingly (col. 5, lines 29 to 48).

That is, Wood teaches selecting hard or soft filter based on the direction of the edge. In other words, Wood does not teach or suggest calculating luminance using the digital data and based on this luminance calculating the smoothing strength. The hard versus soft filter is determined based on the direction of the edge and not based on the digital data nor based on the luminance of this data. Tolumitsu does not cure this identified deficiency of Wood. Therefore, the combined teachings of Wood and Tolumitsu fail to teach or suggest the above-identified feature of the dependent claim 4. For at least this additional reason, claim 4 is patentable.

Independent claims 5, 6, 10, 11, and 13 recite features similar to the features argued above with respect to claim 1. Therefore, similar arguments are submitted to apply with equal force herein. For at least analogous reasons, claims 5, 6, 10, 11, and 13 are patentable over the combined teachings of Wood and Tolumitsu. Claims 8, 9, and 12 are patentable at least by virtue of their dependency on claim 6 or 11. It is appropriate and necessary for the Examiner to withdraw this rejection of claims 5, 6, and 8-13.

In addition, independent claim 5 recites: “generating filter information based on the calculated edge information.” The Examiner alleges that the reconstruction means 60, which transforms the directionally soft filtered data into a series of directionally filtered soft edge images stored in corresponding image memory, is equivalent to generating filter information based on the calculated edge information (see page 3 of the Office Action). Applicant respectfully disagrees.

Wood teaches that the directionally filtered data may be stored temporarily in a directionally filtered data memory means 58. A reconstruction means 60 transforms the directionally soft filtered data from the memory 58 into a series of directionally filtered soft edge images stored in a series of soft directionally filtered image memories 62₁, ..., 62_n. The directionally hard filtered data is reconstructed into a series of directionally filtered images with hard or crisp edges which are stored in a set of hard directionally filtered image memories 64.sub.1, 64.sub.2, ..., 64_n (Fig. 1; col. 5, lines 49 to 58).

Wood, however, further teaches that the reconstruction means 60 performs an inverse of the transform performed by the transform means 50 in order to return the data from the frequency domain to the spatial domain. Directional filters with additional degrees of hardness/softness can be provided and the slope comparing means can select among a wider range of slopes (col. 5, lines 59 to 65). That is, in Wood, the reconstruction means 60 simply converts the data from frequency domain to the spatial domain, whereas the slopes are only used to select a filter.

In short, Wood does not teach or suggest generating filter information based on the calculated edge information. Tolumitsu does not cure this identified deficiency of Wood. Therefore, the combined teachings of these references would not have (and could not have) led an artisan of ordinary skill in the art to have achieved the subject matter of claim 5. For at least this additional reason, claim 5 is patentable.

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Allowable Subject Matter

The Examiner's indication that claims 2 and 7 contain allowable subject matter is gratefully noted. The rewriting of these claims, however, is held in abeyance until arguments presented with respect to independent claims 1 and 6 have been reconsidered.

New Claims

In order to provide more varied protection, Applicant adds claims 14 and 15. Claims 14 and 15 are patentable at least by virtue of their dependency on claim 1.


Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly invited to contact the undersigned attorney at the telephone number listed below.

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Respectfully submitted,



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